

WILDLIFE HARVEST STATUS REPORT
SMALL GAME HARVEST SURVEY -- 2003-2004

Ronald A. Reitz
Resource Scientist
and
Karlene G. Gruber
Resource Assistant

INTRODUCTION

The Small Game Harvest Survey has been sent annually, since 1967, to samples of permit holders who can hunt small game in Missouri. This mail questionnaire consists of asking permit holders if they hunted small game, how many of each species were harvested, where they hunted most, and how many days they hunted. This survey is conducted after the end of the small game hunting season (usually in March).

Beginning with the 1996-97 hunting season, the Small Game Harvest Survey has used the Point of Sale (POS) database of permit buyers to gain greater efficiency through sampling procedures. Stratification of the sampling frame has been used to reduce the variation within the estimates, and non-residents have been included in the survey since 1996. Therefore, the results from the 2003-2004 Small Game Harvest Survey should only be compared to the seven previous survey efforts. For the purposes of this status report, the current year's estimates are compared to the previous year's estimates and the five-year means.

Estimates of hunter numbers, harvest and effort (days afield) were calculated for 18 small game species from the results of the 2003-2004 Small Game Harvest Survey. Questionnaires were mailed to 12,500 people eligible to hunt small game during the 2003-2004 season:

- Resident Small Game Hunting Permit
- Non-Resident Small Game Hunting Permit
- Resident Combination Hunting and Fishing Permit
- Daily Small Game Hunting Permit
- Lifetime Hunting Partner Permit
- Lifetime Conservation Partner Permit

Permits for 2004, sold between December 1, 2003 through February 29, 2004, were valid during the 2003-2004 small game season and were included in the sampling frame for this survey. Of the 11,897 questionnaires successfully delivered, a total of 6,111 responses were received, representing a 51.4% response rate of the questionnaires delivered. Of those, 5,764 were usable for this analysis. This represents a 48.45% usable response rate of the questionnaires delivered.

HUNTER NUMBERS

Total 2003 permit sales for small game hunters, both resident and non-resident, declined slightly (-4.5%; Table 1). Of those 2003 and 2004 permit holders included in our sample, an estimated 69.3% actually hunted small game, up slightly from 67.3% in 2002-2003 (Table 1). The number of estimated small game hunters decreased about 1.5% in 2003-2004 compared to the 2002-2003 estimate. Estimated hunter numbers in 2003-2004 showed potential increases for 11 of the 18 species and decreases for the other seven species (Table 2). One species (dove) showed a significant increase in hunter numbers, as shown by non-overlapping 95% confidence intervals between 2003-2004 and 2002-2003 results. The estimated total number of dove hunters was 43,531, which was an increase of 5,000 hunters from last year's estimate. Overall, hunter numbers appeared to be relatively stable (Table 2).

HARVEST AND EFFORT

Interestingly, while hunter numbers appeared to increase slightly for several species, overall total days spent afield by hunters for 2003-2004 decreased for most popular game species when compared to last year's estimates. The number of days spent afield by squirrel hunters was significantly lower when compared to last year's estimates (Table 2).

Total harvest estimates showed no significant changes for any species in 2003-2004 as demonstrated by overlapping 95% confidence intervals with the 2002-2003 survey. However, total harvest estimates showed potential decreases for 12 of the 18 species surveyed. The other six species (rabbits, quail, doves, groundhogs, ducks, and Canada geese) showed harvest estimates that were potentially higher than the previous year. Overall, harvest appears to be relatively stable (Table 2).

Hunter success, as estimated by bag per day, neither increased nor decreased significantly for all species during the 2003-2004 season (Table 2). Bag per day appears to have remained relatively stable compared to last year's small game seasons.

As expected, with decreased days afield and relatively stable estimates for bag per day, average season bag showed potential decreases for 12 of the 18 species surveyed for 2003-2004. Estimates showed no significant change in average season bag for any of the 18 species in 2003-2004.

DISCUSSION

Overall, the number of small game permits and the proportion of those used by hunters in 2003-2004 decreased slightly when compared to estimates for the 2002-2003 season. The proportion of those that possessed a resident small game hunting permit and actually hunted appears to have increased slightly compared to last season. Combination hunting and fishing, resident small game hunting and non-resident small game hunting/daily small game hunting permit sales decreased slightly from the previous year's sales figures.

In March, 2002, a change was made to the sales structure of the lifetime hunting and conservation partner permits. The permits were sold by the age category the purchaser was in at the time of purchase, making the permit cost more equitable. This change resulted in a significant increase in lifetime permit sales, especially among those 60 years of age and older. This trend continued in 2003-2004, with a 7.9% increase in sales compare to last year. However, this increase did not significantly impact overall sales numbers as these permits represent only a very small percentage of total permit sales.

The overall permit sales decrease is possibly due, in part, to year 2004 hunting permits being available on December 1, 2003, and valid for use during the latter part of the 2003-2004 small game season. These permit sales are not reflected in the 2003 permit sales figures.

While hunter numbers appeared to increase for several species during the 2003-2004 season, the overall potential decrease in estimated average days spent afield and average season bag for those hunters resulted in relatively stable harvest estimates when compared to 2002-2003. There was a significant increase in the number of dove hunters and the proportion of small game hunters pursuing doves in 2003-2004 when compared to the previous season. The number of days spent afield by squirrel hunters appeared to decrease significantly in 2003-2004. Generally, the other species had estimates for total hunters, pressure, bag, days afield and harvest that were relatively stable statistically, when compared to 2002-2003.

TABLE 1. Permit sales and estimated number of small game hunters by permit type from the 2003-2004 Small Game Harvest Survey. Permit sales, given only for comparison purposes, are taken from the *Annual Hunting and Fishing Permit Distribution and Sales Summary*. Estimated number of total hunters as well as hunter numbers for each permit type were generated independently from the permit sales figures. As a result, numbers do not add exactly.

	Combination Hunting and Fishing	Change from 2002	Resident Small Game Hunting	Change from 2002	Non-Res SG Hunt/Daily SG Hunt	Change from 2002	Lifetime Hunting and Conservation	Change from 2002	Total	Change from 2002
2003 Permit Sales	152,237	-3.5%	55,459	-1.0%	11,646	-0.5%	380	7.9%	219,722	-4.5%
Estimated Hunters^a	99,634	-1.5%	49,949	2.7%	10,587	-0.2%	217	-33.0%	160,387	-1.0%
Percent Hunters^b	63.3%	1.4%	80.3%	2.9%	90.9%	1.8%	57.2%	-2.5	69.3%	2.0%

^a 32,655 early 2004 small game permit purchasers were included in our sampling frame that did not hold a 2003 permit. The estimated number of hunters is based on the number of usable addresses available at the time of the survey. Therefore, these estimates may underestimate the actual number of small game hunters holding permits.

^b The percent of hunters are an unbiased estimate of active hunters permitted to hunt small game in Missouri.

TABLE 2. Statewide summary for the Small Game Harvest Survey, 2003-2004, including resident and non-resident hunters. Non-overlap of 95% confidence intervals for current and previous year's estimates denoted by *.

Species	Total Hunters	% Of Hunting Pressure	Bag Per Day	Avg. Season Bag	Avg. Days Afield	Total Harvest	Total Days Afield
Rabbit	75,460	46.2	1.3	7.0	5.5	529,439	418,281
95% CI	72,530-78,123	44.7-47.6	1.2-1.4	6.6-7.5	5.2-6.0	492,540-568,426	385,654-454,691
%Change from 2002-2003	4.9	3.9	5.0	-0.6	-5.6	4.3	-0.9
%Change from 5-year mean	-7.9	-1.9	3.9	2.4	-0.8	-5.9	-8.9
Squirrel	82,687	50.6	1.6	11.2	7.2	928,822	597,142
95% CI	79,533-85,803	49.0-52.2	1.4-1.7	10.6-12.0	6.6-7.9	864,300-994,938	540,613-655,994
%Change from 2002-2003	-3.0	-3.9	11.4	-7.1	-16.5	-9.9	*-19.1
%Change from 5-year mean	-11.5	-5.8	1.7	-4.4	-5.6	-15.5	-16.4
Quail	41,497	25.4	1.7	10.3	5.9	426,590	246,249
95% CI	39,265-43,850	24.1-26.7	1.6-1.9	9.1-11.6	5.4-6.4	369,229-488,747	222,185-272,380
%Change from 2002-2003	4.7	3.8	17.7	8.8	-7.9	13.9	-3.5
%Change from 5-year mean	-14.3	-7.8	9.1	6.8	-1.0	-9.9	-15.6
Dove	43,531	26.6	4.4	18.5	4.3	806,349	185,458
95% CI	41,110-45,960	25.3-28.0	4.1-4.6	17.2-19.8	4.0-4.5	733,863-877,307	170,074-202,389
%Change from 2002-2003	*13.0	*12.0	8.5	4.2	-4.0	17.7	8.5
%Change from 5-year mean	4.7	11.3	5.1	7.5	2.5	12.6	7.1
Pheasant	11,995	7.3	0.5	2.5	5.4	29,848	65,220
95% CI	10,696-13,381	6.6-8.2	0.4-0.6	2.1-2.9	4.6-6.4	23,842-36,219	53,012-79,405
%Change from 2002-2003	7.6	6.5	-8.0	-14.7	-7.2	-8.2	-0.2
%Change from 5-year mean	-20.9	-15.2	-11.5	-7.6	2.4	-28.2	-19.1
Woodcock	2,044	1.2	0.6	2.6	4.1	5,257	8,331
95% CI	1,507-2,575	0.9-1.6	0.4-0.9	1.8-3.5	2.9-5.6	3,197-7,690	5,248-12,224
%Change from 2002-2003	24.3	22.5	-21.0	-30.2	-11.1	-13.1	9.8
%Change from 5-year mean	11.4	16.4	-9.1	2.2	8.8	16.7	22.1

Species	Total Hunters	% Of Hunting Pressure	Bag Per Day	Avg. Season Bag	Avg. Days Afield	Total Harvest	Total Days Afield
Crow	12,322	7.5	1.8	9.1	5.1	112,024	63,299
95% CI	11,002-13,640	6.7-8.4	1.4-2.2	7.3-11.3	4.1-6.5	86,517-141,353	48,801-81,273
%Change from 2002-2003	-4.5	-5.4	-5.3	-10.6	-5.7	-14.6	-10.0
%Change from 5-year mean	-3.4	2.1	-11.5	-17.0	-5.1	-18.9	-7.7
Groundhog	4,462	2.7	0.5	2.7	5.8	12,048	25,654
95% CI	3,664-5,371	2.2-3.3	0.3-0.7	2.1-3.4	3.7-8.4	8,795-15,881	15,484-39,524
%Change from 2002-2003	19.2	18.2	84.6	11.6	-47.3	32.7	-37.3
%Change from 5-year mean	13.8	20.4	-2.8	3.0	-13.4	16.6	1.0
Raccoon	12,417	7.6	0.9	10.4	11.2	129,327	138,441
95% CI	11,125-13,750	6.8-8.4	0.8-1.1	8.3-13.1	9.6-12.8	99,980-166,633	114,728-165,525
%Change from 2002-2003	-12.0	-12.7	-8.8	-27.0	-20.4	-35.8	*-29.9
%Change from 5-year mean	-8.2	-2.5	-16.8	-22.9	-7.6	-30.3	-15.6
Gray Fox	1,769	1.1	0.1	0.7	10.5	1,294	18,634
95% CI	1,252-2,357	0.8-1.4	0.02-0.2	0.3-1.5	6.5-15.5	429-2,583	9,948-29,503
%Change from 2002-2003	-6.4	-7.7	-22.2	-25.5	-2.9	-30.5	-9.1
%Change from 5-year mean	28.3	35.3	-34.0	-43.7	-17.2	-27.2	5.6
Red Fox	2,543	1.6	0.1	0.8	11.3	2,069	28,817
95% CI	1,898-3,235	1.2-2.0	0.04-0.1	0.4-1.4	7.4-15.4	1,061-3,654	16,420-42,232
%Change from 2002-2003	-2.6	-3.1	-36.4	-18.2	22.6	-20.2	19.5
%Change from 5-year mean	26.9	34.0	-16.7	-4.5	10.6	19.7	42.0
Coyote	23,961	14.7	0.2	2.3	13.1	54,153	313,328
95% CI	22,015-25,984	13.5-15.9	0.1-0.2	2.0-2.6	10.0-16.8	46,186-62,919	236,799-404,617
%Change from 2002-2003	2.8	1.9	-14.3	-5.4	14.2	-2.8	17.3
%Change from 5-year mean	6.8	13.3	-32.3	-10.0	36.8	-3.9	45.5

Species	Total Hunters	% Of Hunting Pressure	Bag Per Day	Avg. Season Bag	Avg. Days Afield	Total Harvest	Total Days Afield
Bobcat	4,108	2.5	0.1	0.5	8.6	2,076	35,440
95% CI	3,255-4,952	2.0-3.0	0.04-0.1	0.3-0.7	6.4-11.2	1,276-3,008	23,665-47,947
%Change from 2002-2003	-2.7	-3.8	0.0	-1.9	0.9	-5.3	-1.8
%Change from 5-year mean	59.7	66.0	-26.8	-30.3	8.0	20.1	69.6
Opossum	4,031	2.5	0.6	6.1	9.5	24,644	38,441
95% CI	3,262-4,858	2.0-3.0	0.5-0.9	4.5-7.9	6.8-12.4	17,061-33,846	25,422-53,523
%Change from 2002-2003	-7.9	-8.5	16.1	5.7	-9.9	-2.7	-16.9
%Change from 5-year mean	-0.8	5.4	0.6	6.4	5.6	2.1	3.5
Ruffed Grouse	286	0.2	0.04	0.1	3.1	34	885
95% CI	106-497	0.1-0.3	0-0.1	0-0.4	1.8-4.5	0-103	309-1,622
%Change from 2002-2003	340.0	350.0	-82.6	-86.0	-6.0	-43.3	-63.7
%Change from 5-year mean	17.0	45.2	-70.6	-78.3	-5.8	-79.7	-89.6
Ducks	36,088	22.1	1.6	13.5	8.6	487,340	308,770
95% CI	33,862-38,500	20.7-23.5	1.5-1.7	12.4-14.6	7.9-9.2	436,854-538,737	279,602-339,976
%Change from 2002-2003	4.9	4.0	10.5	11.1	0.4	16.5	5.2
%Change from 5-year mean	4.7	10.9	7.2	5.4	-2.1	10.2	2.3
Canada Geese	15,308	9.4	0.6	4.1	6.5	62,096	99,251
95% CI	13,687-16,949	8.4-10.4	0.6-0.7	3.4-4.8	5.7-7.4	50,854-75,163	83,464-115,530
%Change from 2002-2003	4.4	3.5	*37.0	26.1	-7.3	31.7	-3.1
%Change from 5-year mean	-6.3	-0.5	26.5	22.6	-5.5	14.3	-11.3
Snow Geese	8,833	5.4	1.8	10.8	6.0	95,674	53,023
95% CI	7,537-10,100	4.6-6.2	1.2-2.5	7.6-14.7	4.7-7.7	64,172-132,557	39,739-68,947
%Change from 2002-2003	12.6	11.5	-35.5	-46.8	-16.7	-40.2	-6.1
%Change from 5-year mean	0.4	6.7	7.9	-8.1	-14.3	-6.9	-14.3